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A new record of the barred knifejaw *Oplegnathus fasciatus* (Perciformes, Oplegnathidae), a Pacific fish, in the Adriatic Sea (Urinj, Croatia)

by

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Résumé. – Nouvelle signalisation d'*Oplegnathus fasciatus* (Perciformes, Oplegnathidae), originaire du Pacifique, en mer Adriatique (Urinj, Croatie).

Le 23 novembre 2015, un spécimen d'*Oplegnathus fasciatus* a été capturé dans une nasse destinée à pêcher *Nephrops norvegicus* à environ un mile nautique au large d'Urinj (côte croate de la baie de Rijeka, dans le nord de l'Adriatique) (45°17'00.40"N ; 14°30'35.95"E). C'est le premier signalement de cette espèce dans la partie croate de la mer Adriatique.

Keywords. – Oplegnathidae - *Oplegnathus fasciatus* - Adriatic - Croatian coast - First record.

Appearance of non-indigenous fishes in the Mediterranean Sea is increasing and accelerating over time. New taxa of marine flora and fauna, including fishes, are recorded each year in the Adriatic Sea (Dulčić and Dragičević, 2013). Although most of non-indigenous species naturally inhabit adjacent seas, some have areas of distribution far afield from either the North-Eastern Atlantic or the Red Sea. Such species include, for example, dwarf flathead, *Elates ransonnetti* (Steindachner, 1876) (Dulčić *et al.*, 2010) from the Central Pacific, silver pomfret *Pampus argenteus* (Euphrasen, 1788) (Dulčić *et al.*, 2004) from Indo-West Pacific, sapphire devile *Chrysiptera cyanea* (Quoy & Gaimard, 1825) (Lipej *et al.*, 2014) and largescaled terapon *Terapon theraps* Cuvier, 1829 (Lipej *et al.*, 2008) from Indo-Pacific, creole fish *Paranthias furcifer* (Valenciennes, 1828) (Dulčić and Dragičević, 2013) and angelfish *Holocanthus ciliaris* (Linnaeus, 1758) (Dulčić and Dragičević, 2013) from western Atlantic. It could therefore be assumed that in such cases human transport is the most probable mode of introduction and the agents that have usually been implicated are aquaculture, aquarium trade, and shipping.

The barred knifejaw *Oplegnathus fasciatus* (Temminck & Schlegel, 1844) is benthopelagic species, which inhabits coastal rocky reefs in Northwest Pacific (Japan, Korea and Taiwan) and Eastern Pacific (Hawaii) (Nakabo, 2002). This species can reach a total length of 80 cm and the maximal recorded weight is 6.4 kg. Its prey consists mostly of hard-shelled invertebrates such as crustaceans and molluscs. Juveniles often seek shelter near floating objects and are included among the most dominant fish species associated with drifting seaweeds, and are also known to drift with oceanic

debris. It is a commercially important species that is also farmed and sought after as game fish (Froese and Pauly, 2015).



Figure 1. - *Oplegnathus fasciatus*, caught in the Adriatic Sea (Croatian coast, 1 Nm off Urinj, Rijeka Bay).

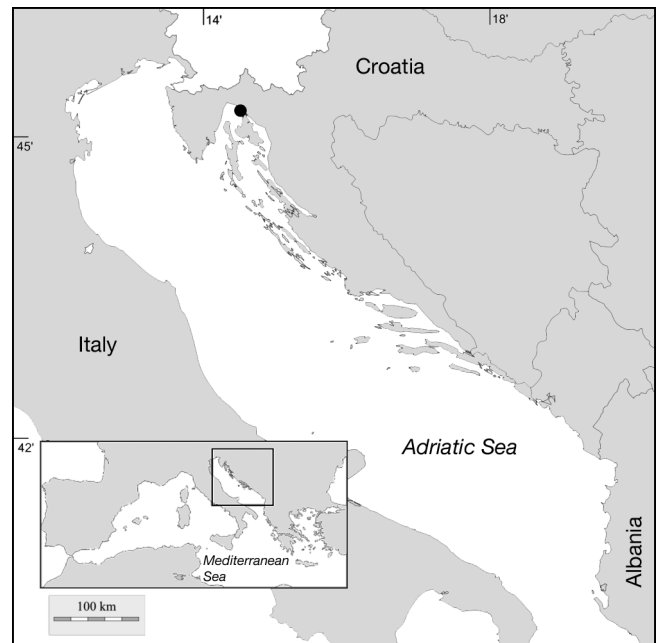


Figure 2. - Catch location of *O. fasciatus* in the Adriatic Sea (Croatian coast, off Urinj, Rijeka Bay).

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This paper reports the first record of the barred knifejaw *O. fasciatus* in the Croatian part of the Adriatic Sea and to discuss on the possible modes of its introduction.

On 23 November 2015, one specimen of *O. fasciatus* (Fig. 1) was caught by a trap designed for catching *Nephrops norvegicus* at around 1 nautical mile off the Urinj (Rijeka Bay, Croatian coast, northern Adriatic) (45°17'00.40"N; 14°30'35.95"E) (Fig. 2). The specimen was photographed, measured and weighed. All measurements were taken with a dial caliper to the nearest mm. The specimen was identified following Nakabo (2002) and is deposited at the Ichthyological collection in the Laboratory of ichthyology and coastal fishery of the Institute of Oceanography and Fisheries in Split, Croatia (collection number IOR-Ofasc-382).

The specimen measured 100 mm in total length (TL) and weighed 18.1 g. The main morphometric and meristic parameters are shown in table I. These are the first data for this species in the Mediterranean area.

First record of this species in the Mediterranean was reported from Maltese waters. Two specimens were caught in the winter of 2009; they were photographed (length was approximated from photos) and released back to the sea (Schembri *et al.*, 2010). Recently, one specimen (approximately 140 mm TL) was caught by fishermen in Trieste Bay (Italian waters, northern Adriatic Sea), but the specimen was not preserved (Ciriaco and Lipej, 2015).

Considering that the fish was found at a great distance from its native geographic range, several hypotheses have arisen as to the means of its arrival. The first hypothesis is that this may represent a case of vagrant fish, a phenomenon already documented for some species (for example *Cyclopterus lumpus* Linnaeus, 1758) captured in the Adriatic Sea (Dulčić and Golani, 2006). However, this scenario is highly improbable due to the biology of the species and the fact that the fish was caught in juvenile stage (low probability of survival), with a great distance between native and capture

areas. The second hypothesis is the introduction via aquaculture or aquarium trade, but this is also less probable since this species has never been legally imported for either commercial or experimental aquaculture or for aquarium use in Croatia (after contact with State Institute for Nature Protection of Republic of Croatia and Directorate for marine fisheries at Ministry of Agriculture Republic of Croatia). Most plausible scenario is that the specimen was introduced by shipping activities. Presence of three important ports and harbours close to the catch location (Omišalj, Urinj-Bakar and Rijeka) supports this hypothesis. Similar view is proposed by Schembri *et al.* (2010) in the case of occurrence of this species around Malta (transport of *O. fasciatus* through a sea-chest or similar water-filled space in a large vessel). It is also interesting that this species was also recorded as an alien species in the western part of the USA and believed to be a debri of the Japanese March 2011 tsunami (see in Ciriaco and Lipej, 2015).

The issue of introduced organisms is complex and exceptionally relevant. With regard to fishes, Adriatic Sea still has not experienced a significant impact by those species on native ecosystem. However, lack of continuous monitoring programmes, especially in the areas of big ports, which are considered as hot spots for introduction of alien organisms, leave us with a significant lack of relevant data. Therefore, our aim for the future is to increase public awareness through citizen science programs, which might increase probability of detection of alien species.

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Table I. - Meristic counts and morphometric measurements of *O. fasciatus* caught in the Adriatic Sea (Croatian waters). *: in relation to LH.

Parameters	Length (mm)	In relation to LT (%)
Total length (TL)	100	100
Standard length (SL)	75	75
Body depth (BD)	47	47
Head length (HL)	27	100*
Eye diameter	8	29.6*
Preorbital length	8	29.6*
Postorbital length	12	44.4*
Interorbital distance	7	25.9*
Depth of caudal peduncle	9	9
Prepelvic length	32	32
Preanal length	54	54
Predorsal length	32	32
Length of dorsal fin	51	51
Length of anal fin	22	22
Length of pectoral fin	18	18
Length of pelvic fin	19	19
Meristics		
Dorsal fin	XII + 16	
Pectoral fin	18	
Anal fin	III+13	
Pelvic fin	I+5	
Caudal fin	18	